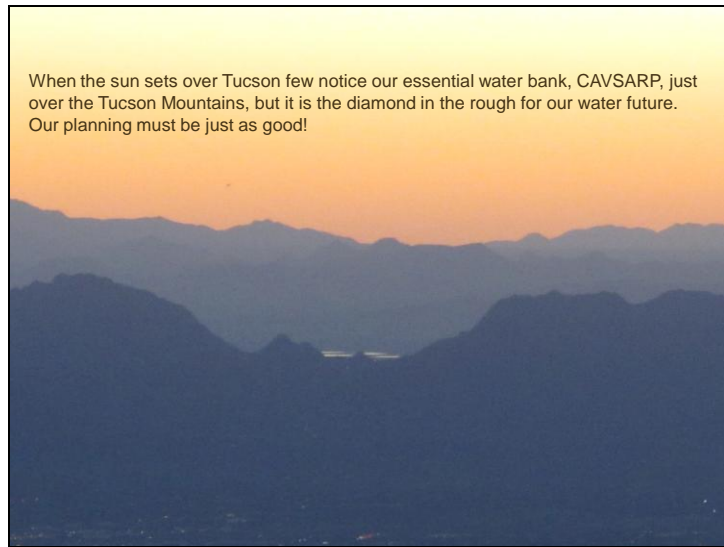
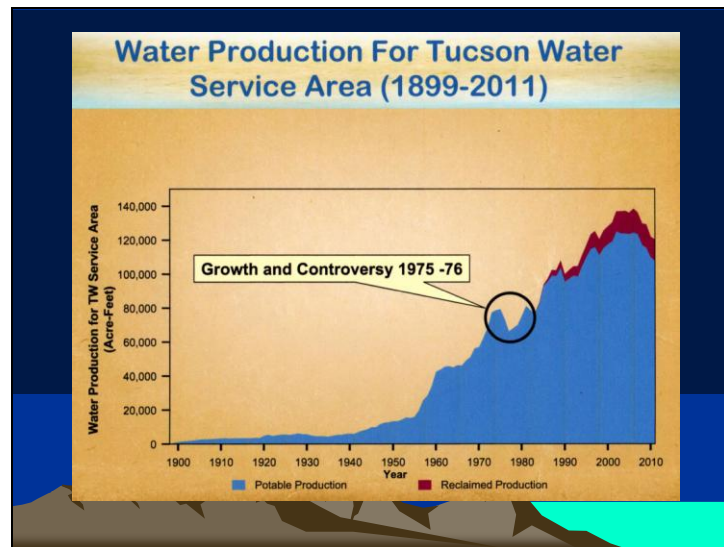


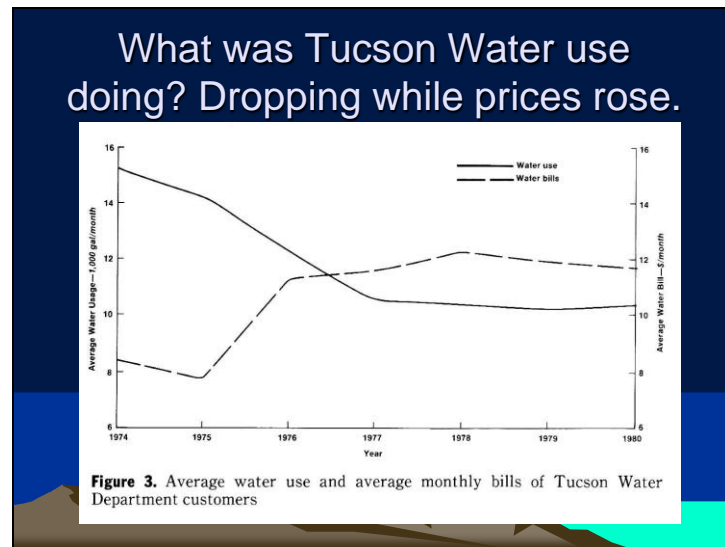
Slide 2



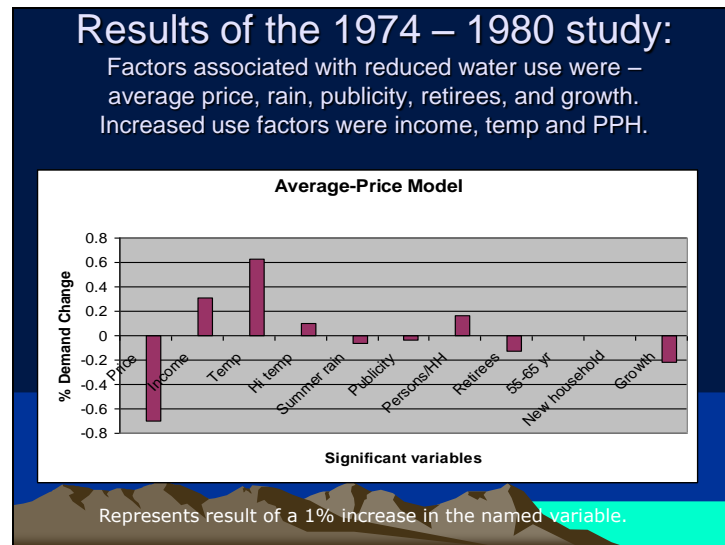
Sunset view from Windy Point includes the reflection of CAVSARP, a critical element of our water infrastructure!



This water production graphic shows our water use history. Note the notch indicating a major cut in demand for water in the mid 1970s... Bruce (Dr. Billings) and I studied that in great detail. We found strong correlations between price, income, demographic and other social factors, climate factors and water use.

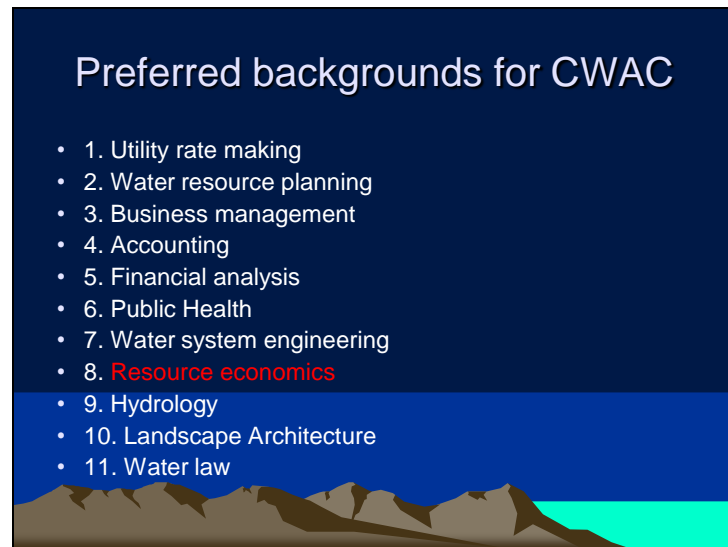


I'll take a minute to describe what we found: first, we found that when the rates were inverted, to charge more per unit as use increases, instead of less – and this is the kind of rate structure we still have – average use dropped from more than 15 Ccfs to a little more than 10 Ccfs.

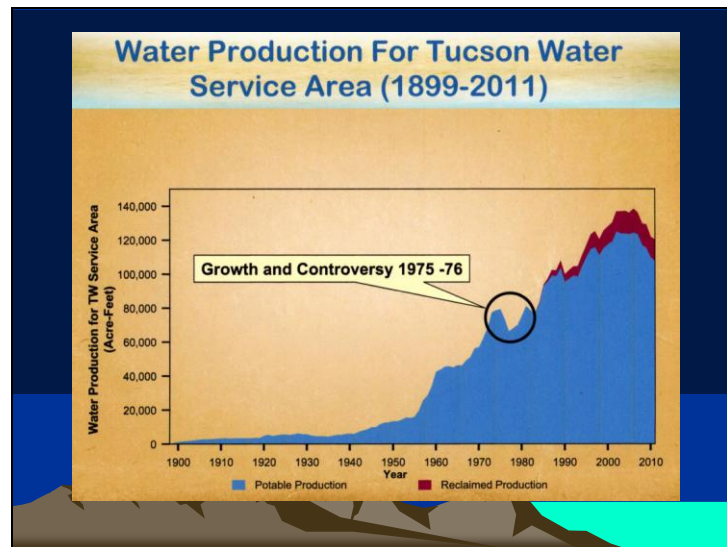


This second graphic shows the model results, which reveal the relative strengths of correlations for the factors we found related to water use: price and temperature are the largest, with income a major factor, as well. Lesser factors were rain, PPH, growth, retirees, and even a modest publicity factor. News promoted conservation, but only while press is heavy; when news tapers off, so does conservation.

(Elasticity was -.7% on price for a 1% increase — typical is -.4% to -.7%. We need to learn whether this is still true — the same reaction to price increases!)

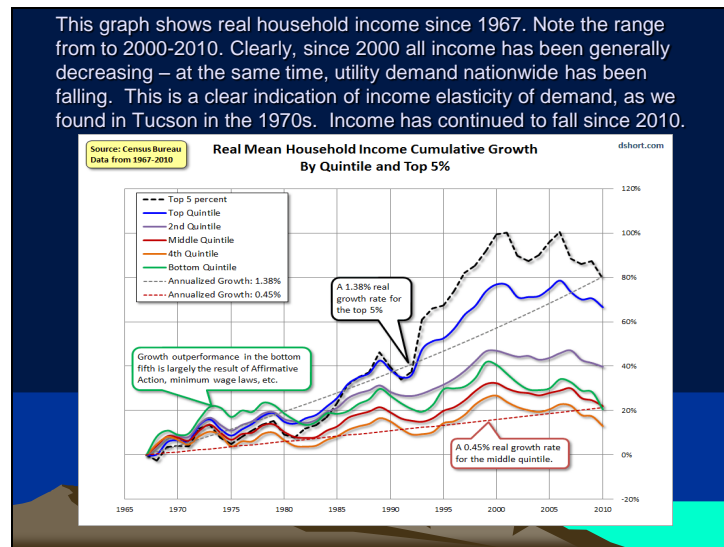


Mayor and Council directives recommend that CWAC should include, among other professions, resource economists.



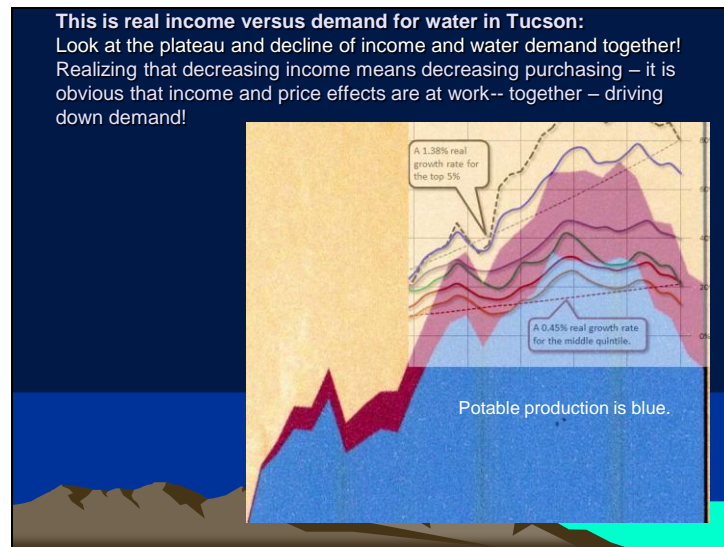
Looking back at the hydrology graphic for water production in Tucson, there is a pretty good notch in the 1970s, but there is also a huge flattening and presumably even larger notch emerging right now.

Slide 8



Recently, I discovered this graphic using Census data to illustrate the trend of income in our country, which coincidentally corresponds in a rather obvious way with our recent water productivity. Let me illustrate.

Slide 9



If you look at this graphic, you can see that there is strong correlation between income (choose any quartile) and our water production (the blue and light blue) which is also our water demand. The message is telling: economic factors are overwhelming all other demand factors! Large scale conservation is tied to economic factors. This is our main conservation program, unless we enforce mandates.



Let's track economic data!

- Engineering models are broken...
- Enterprise fund needs to understand its economic environment...
- Conservation is largely economic behavior
- Understanding incentives will inform ops
- Large-scale conservation is economics, unless we forbid water uses!

Our engineering-based planning models have been declared broken, yet this information suggests that there is a very simple fix for those models: the introduction of economic factors.

I believe there is a potential to fundamentally benefit Tucson Water operations by econometric modeling of our customers' demand for our vital product. This is the way to understand large-scale conservation. Tracking this data gives us a way to learn the difference between economically-driven conservation and technologically-driven conservation, and the interaction of the two.



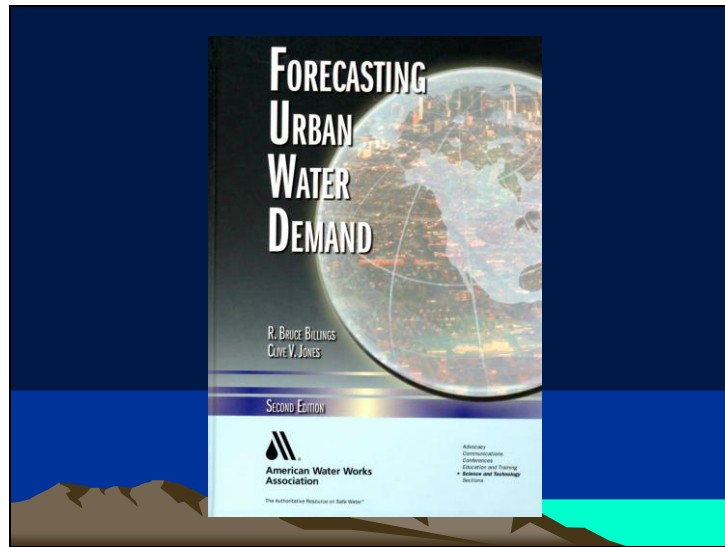
I think this is as good a time as any to take advantage of this field of knowledge. It would require additional data gathering, and additional analysis. The work could be accomplished by augmented staff, consultants, or academics, -- with appropriate agreements, -- or even all three.

We found that if you pay more than 2% of income, then you pay attention to actual water prices, if not, then you tend to just look at the entire bill and respond to impact on your wallet.

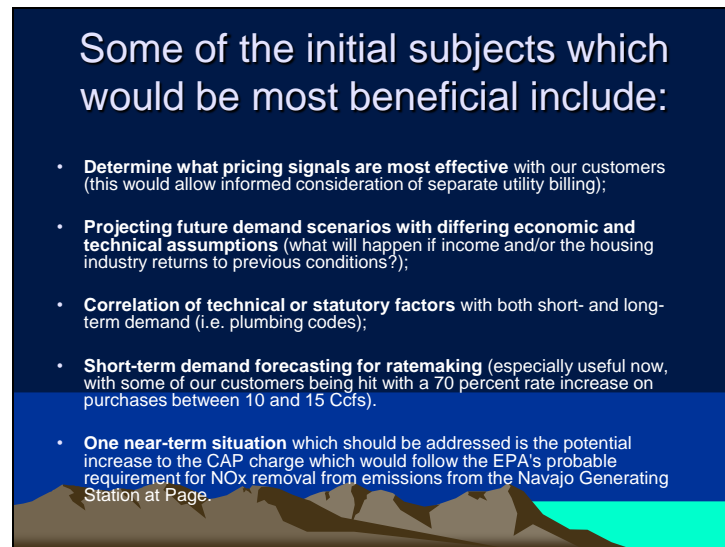
When housing fills back up, will people go right back to using water the same way they did before, or will their behavior be forever changed in some way? (Assuming their incomes are fully restored...)

There's been no economic analysis like this for a long time; this is the time to act.

Slide 12



We also have the unique benefit of having a co-author of AWWA's forecasting text sitting on this committee, Bruce Billings.

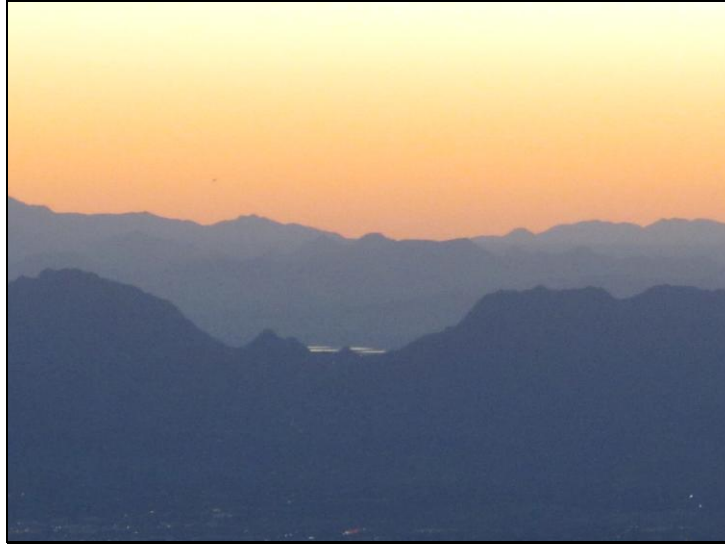


Some of the initial subjects which would be most beneficial include:

- 1) Determine what pricing signals are most effective with our customers (this would allow informed consideration of separate utility billing);
- 2) Projecting future demand scenarios with differing economic and technical assumptions (what will happen if income and/or the housing industry returns to previous conditions?);
- 3) Correlation of technical or statutory factors with both short- and long-term demand (i.e. plumbing codes);
- 4) Short-term demand forecasting for ratemaking (especially useful now, with some of our customers being hit with a 70 percent rate increase: 11-15 Ccf).

One near-term situation which should be addressed is the potential increase to the CAP charge which would follow the EPA's probable requirement for NOx removal from emissions from the Navajo Generating Station at Page.

Also, without this kind of insight into demand, I believe it may prove impossible to guide demand toward our 'safe yield' target!



I am asking the Chair to assign the Technical/Planning and Policy Subcommittee to investigate this subject, and to make recommendations to CWAC and the Director on how to proceed to upgrade Tucson Water's data gathering and analysis capabilities to include economic factors for conservation, planning, forecasting, ratemaking and other operational activities.